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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,986	08/20/2003	Peter H. McDonald	CS-21,295	4994

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EXAMINER	
MCDONALD, RODNEY GLENN	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/643,986	MCDONALD, PETER H.	
	Examiner	Art Unit	
	Rodney G. McDonald	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 6, 2006 has been entered.

Specification

The use of the trademark VITON has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 contains the trademark/trade name viton. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or

product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe vacuum seal and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Hurwitt et al. (U.S. Pat. 5,130,005).

Regarding claim 16, Hurwitt et al. teach a magnetron sputtering apparatus comprising a vacuum chamber 10. (Column 5 lines 18-20, lines 23-25) Hurwitt et al. teach the vacuum chamber having an opening adapted for securing a removable target assembly. (Figure 1) Hurwitt et al. teach a support structure (37) surrounding the opening of the vacuum chamber and spaced outside of securing means (49) for the removable target. (Fig. 1) Hurwitt et al. teach a rotating magnet assembly secured to the support structure and disposed over the opening and adapted to be spaced apart

from the removable target assembly. (Column 6 lines 59-68; Column 7 lines 1-10) Motor means for rotating the magnet assembly. (Column 7 lines 18-35) Power means for energizing the magnet assembly is inherent since electromagnets can be utilized. (Column 4 lines 23-26)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. (U.S. Pat. 6,030,514) in view of Marton et al. (U.S. PG Pub. 2003/0059640)

Regarding claim 1, Dunlop et al. teach a method of dry treating a target surface prior to using the target for sputtering. Dunlop teach subjecting at least a portion of the

target to a non-mechanical surface treatment step to produce a target surface treat portion whereby at least one of impurities present on the target surface treated portion is removed and a surface area of the target surface treated portion is reduced. (Column 8 lines 37-45) The non-mechanical surface treatment step comprises surface treating the portion of the target by one of ionic cleaning, ionic milling, ***sputtering***, chemical etching, chemical polishing, electrolytic polishing, electrolytic etching, laser ablation, electron ablation, or ***combinations thereof***. (Column 8 lines 62-67) The target is removed from the surface treatment process (i.e. sputtering chamber) and is prepared and packed for subsequent use in a sputtering deposition process. (Column 8 lines 46-51; Column 5 lines 10-15)

Regarding claim 6, Dunlop et al. teach the surface treated portion of the target assembly is placed in an enclosure to protect it during storage and shipment. (Column 8 lines 46-51)

Regarding claim 7, Dunlop et al. teach the enclosure is metallic and the metallic enclosure containing the target assembly is further placed into a different enclosure. (Column 8 lines 46-51)

Regarding claim 8, Dunlop et al. the target materials include aluminum, titanium, transition metals, refractory metals, silicides, indium tin oxide, composites, bonded assemblies or combinations thereof. (Column 8 lines 16-20)

The differences between Dunlop and the present claims is that the specifics of the treatment method prior to packaging is not discussed (Claims 1, 3), the target

surface being treated in an inert atmosphere is not discussed (Claim 4), the inert atmosphere being argon is not discussed (Claim 5).

Regarding claims 1, 3, Marton et al. teach sputtering to condition or clean the surface of a target prior to using the target for deposition. (Page 5 paragraph 0050) The target conditioning is performed by utilizing a magnetron to produce a plasma for about 10 to 40 minutes. The magnetron power is about between 0.1 kW to 1 kW. Ar gas is feed regulated to adjust the Ar gas pressure to maintain a constant cathode voltage. (Page 7 paragraph 0074)

Regarding claims 4, 5, Marton et al. teach that Ar gas can be used as the inert gas. (Page 7 paragraph 0074)

The motivation for utilizing the features of Marton et al. is that it allows for conditioning or cleaning the target. (Page 7 paragraph 0074)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dunlop by utilizing the features of Marton et al. because it allows for conditioning or cleaning of the target.

Claims 2 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Marton et al. as applied to claims 1 and 3-8 above, and further in view of Ding et al. (US PGPUB 2003/0089601).

The difference not yet discussed is the magnetron to be rotatable and the magnetic component to be disposed on less than a 180-degree arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the target. (Claim 2)

Regarding claim 2, Ding discloses a sputtering apparatus comprising a rotating magnetron system comprising a magnetron that comprises less than 180 degrees (Figure 1) with corresponding side magnets (Figure 1) that provides the benefit of smaller rotating magnetron is that the target power density can be maximized and results in uniform target erosion [0017].

The motivation for utilizing the features of Ding et al. is that it allows for maximizing target power density that results in uniform target density. (Paragraph 0017)

Regarding claim 10, Dunlop et al. teach that the burn-in time can be reduced by at least 10%. (Column 7 lines 30-32)

Regarding claim 11, Marton et al. teach the process conditions as discussed above. (See Marton et al. discussed above)

Regarding claim 12, Dunlop et al. teach the target materials as discussed above. (See Dunlop et al. discussed above)

Regarding claim 13, Dunlop et al. teach the target assembly as discussed above. (see Dunlop et al. discussed above)

Regarding claim 14, Marton et al. teach the process condition as discussed above. (See Marton et al. discussed above)

Regarding claim 15, Dunlop et al. teach the target assembly as discussed above. (See Dunlop et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ding et al. because it allows for maximizing target power density that results in uniform target density.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Marton et al. as applied to claims 1-8 and 10-15 above, and further in view of Arai et al. (U.S. Pat. 6,187,457).

The difference not yet discussed is the use of a FeNdB magnets.

Arai et al. teach that using a FeNdB magnet component in a magnetron is common in the art and therefore obvious (col. 6, 1. 50-57).

The motivation for utilizing the features of Arai et al. is that it allows for utilizing a magnetron for sputtering. (Column 6 lines 50-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Arai et al. because it allows for utilizing a magnetron for sputtering.

Claims 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurwitt et al. (U.S. Pat. 5,130,005) in view of Ding et al. (US PGPUB 2003/0089601).

Hurwitt et al. is discussed above and all is as applies above. (See Hurwitt et al. discussed above)

The difference not yet discussed is the magnetron to be rotatable and the magnetic component to be disposed on less than a 180-degree arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the target. (Claim 17)

Regarding claim 17, Ding discloses a sputtering apparatus comprising a rotating magnetron system comprising a magnetron that comprises less than 180 degrees (Figure 1) with corresponding side magnets (Figure 1) that provides the benefit of smaller rotating magnetron is that the target power density can be maximized and results in uniform target erosion [0017].

The motivation for utilizing the features of Ding et al. is that it allows for maximizing target power density that results in uniform target density. (Paragraph 0017)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ding et al. because it allows for maximizing target power density that results in uniform target density.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hurwitt et al. in view of Ding et al. as applied to claim 17 above, and further in view of Arai et al. (U.S. Pat. 6,187,457).

The difference not yet discussed is the use of FeNdB magnets.

Arai et al. teach that using a FeNdB magnet component in a magnetron is common in the art and therefore obvious (col. 6, 1. 50-57).

The motivation for utilizing the features of Arai et al. is that it allows for utilizing a magnetron for sputtering. (Column 6 lines 50-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Arai et al. because it allows for utilizing a magnetron for sputtering.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurwitt et al. in view of Ding et al. as applied to claim 17 above, and further in view of Demaray et al. (U.S. Pat. 5,676,803).

The difference not yet discussed is the use of a viton seal.

Regarding the viton seal, Demaray et al. teach utilizing a viton seal to join the target assembly to the chamber. (Column 11 lines 34-42)

The motivation for utilizing the viton seal is that it allows joining the target assembly to the chamber. (Column 11 lines 34-42)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a viton seal as taught by Demaray et al. because it allows for joining the target assembly to the chamber.

REMARKS:

Levine et al. and Leiphart have been withdrawn. Marton et al. and Hurwitt et al. have now been applied. Marton et al. teach conditioning or cleaning the target surface with a magnetron at Applicant's claimed process conditions by sputtering the target in an inert gas atmosphere. Dunlop et al. recognize that a sputtering process such as that taught by Marton et al. is a method that cleans the target. Dunlop et al. recognize that the burn-in time is reduced by such a preconditioning process as is required by Applicant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
November 21, 2006